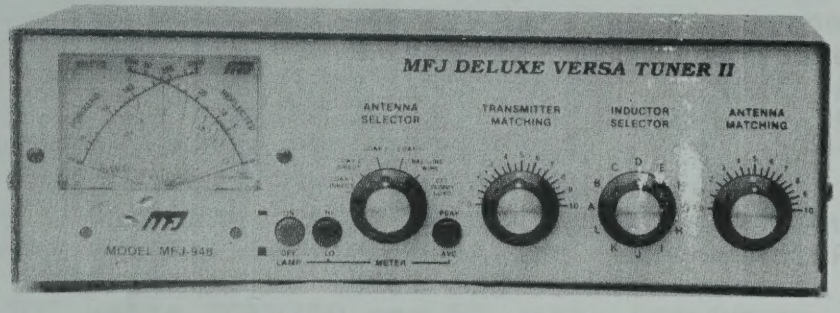
MFJ DELUXE VERSA TUNER II



MODEL MFJ-948
INSTRUCTION MANUAL

CAUTION: Read All Instructions Before Operating Equipment

MFJ ENTERPRISES, INC.

P.O.BOX 494, MISSISSIPPI STATE, MS 39762, USA

COPYRIGHT © 1990 MFJ ENTERPRISES, INC.

MFJ-948 DELUXE VERSA TUNER II INSTRUCTIONS

GENERAL INFORMATION

The MFJ-948 is designed to match virtually any transmitter to almost any antenna, including dipoles, inverted-vees, verticals, mobile whips, beams, random wires, and others fed by coax lines, balanced lines, or a single wire. A 4:1 balun is built-in for connection to balanced lines. An antenna-selector switch provides versatile antenna selection. The MFJ-948 will handle upto 300 watts of RF output power from the transmitter from 160 through 10 meters. The MFJ-948 employs a peak reading cross-needle meter so forward power, reflected power, and SWR may be read simultaneously.

PEAK READING SWR/WATTMETER

The meter on the MFJ-948 may be used with the tuner or by itself. To use the meter without the tuner, set the ANTENNA SELECTOR to COAX 1 DIRECT or COAX 2 DIRECT. The MFJ-948 utilizes a cross-needle meter so peak or average FORWARD power, REFLECTED power and SWR may be read simultaneously in two ranges. To read FORWARD power, set the power range switch to HI(300 watts) or LO(30 watts). Next read the power level on the FORWARD SCALE. REFLECTED power is shown at the same time on the REFLECTED POWER SCALE. SWR is read by observing where the two needles cross. No SWR sensitivity adjustment is needed to read SWR. You get a peak holding average reading when you set the METER button to PEAK. Read the power level off of both scales. The HI range is 300 watts FORWARD and 60 watts REFLECTED. The LO range is 30 watts FORWARD and 6 watts REFLECTED. The difference between the HI and LO scales readings is a factor of 10.

The meter lamp can be powered by a 12V DC source, such as the optional MFJ-1312 power supply. Use a 2.5mm plug with the tip of the plug connected to the positive. The METER LAMP ON/OFF switch will activate the meter lamp.

ANTENNA SELECTOR

The ANTENNA SELECTOR switch allows selecting two coax antennas either directly or through the tuner, a balanced-line antenna, a wire antenna. An external 50 ohm dummy load can be connected to the EXT. LOAD connector located at the rear of the tuner. Do not continously key into the dummy load for more than 2 minutes at a time. CAUTION: DO NOT OPERATE THE ANTENNA SELECTOR SWITCH WHILE TRANSMITTING. Never use the MFJ-948 for over 300 watts of RF output power, even in the DIRECT or DUMMY LOAD positions.

INSTALLATION

1. Locate the tuner in a convenient location at the operating position. NOTE: LOCATE THE TUNER SO THE REAR IS NOT ACCESSABLE DURING OPERATION. If random wire or balanced line operation is used, the ceramic feed through insulators will have high RF voltages which can cause serious RF burns if touched when transmitting.

2. Install the MFJ-948 between the transmitter and antenna as shown in the diagram above. A coax line is connected to the transmitter and the SO-239 coax connector marked TRANSMITTER on the back of the tuner.

3. One or two coax-fed antennas may be connected to the SO-239 coax connectors marked COAX 1 or COAX 2. NOTE: Coax 1 and Coax 2 antennas may be connected directly to the transmitter, bypassing the tuner, by setting the ANTENNA SELECTOR switch to COAX 1 DIRECT or COAX 2 DIRECT respectively.

4. A random wire antenna may be connected to the five way binding post marked WIRE. The random length wire should be long, high, and as clear of surrounding objects as possible. For optimum operation, the wire antenna should be a quarter-wavelength or longer at the operating ferquency. Do NOT ground the random wire antenna. Make certain that the tuner is well-grounded to the transmitter. A binding post marked GROUND is provided for ground connection(s).

5. A balanced line fed antenna may be connected to the two five way binding posts marked BALANCED LINE. A jumper wire from the WIRE binding post, as indicated by a dotted line on the MFJ-948, should be connected to one of the posts of the BALANCED LINE. This couples the MFJ-948 to the balanced line through a 4:1 balun.
NOTE: Either a balanced line or a random wire antenna may be connected to the MFJ-948 at one time. If a random length wire is used, make sure that there is no jumper wire between the WIRE and BALANCED LINE binding posts.

6. An external 50 ohm dummy load maybe connected to the EXT. DUMMY LOAD connector located at the rear of the tuner.

USING THE MFJ-948

The INDUCTOR switch on the MFJ-948 represents minimum inductance at position A and a maximum inductance at position L. Less inductance is needed at higher frequencies than at low frequencies for the same impedance. The TRANSMITTER and ANTENNA controls both represent maximum capacitance at position 10. For optimum operation of the MFJ-948, the transmitter must be tuned to a 50 ohm output impedance at the frequency of operation. Set the ANTENNA SELECTOR switch to DUMMY LOAD for tuning up the transmitter.NOTE: Always tune the transmitter at a low output power.

After properly tuning the transmitter, set ANTENNA SELECTOR to the desired antenna and tune the tuner for a minimum SWR as described below. Do NOT readjust the transmitter loading control setting after loading it to a 50 ohm load.

1. Set the TRANSMITTER and ANTENNA controls to 5. The capacitors are half-opened.

2. Rotate the INDUCTOR control until maximum noise is obtained with your transceiver in the receiving mode.

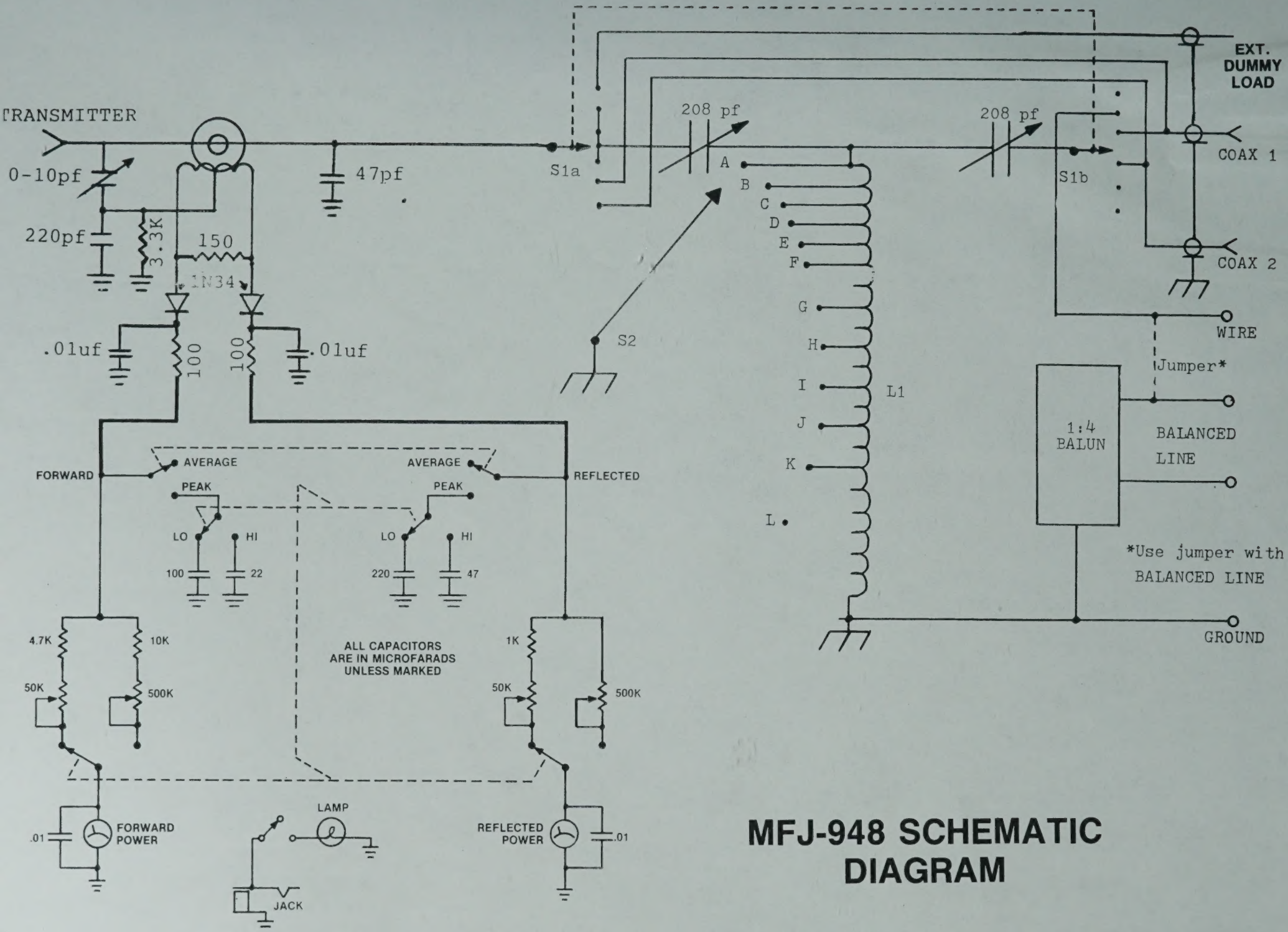
3. While transmitting a steady state carrier (CW) alternately adjust "TRANSMITTER" and "ANTENNA" controls for minimum SWR. Since both controls interact, the two controls can best be adjusted by turning the TRANSMITTER control a small increment at a time, then rotating the ANTENNA control for minimum SWR. Repeat until minimum SWR is obtained.

4. If a SWR of 1:1 is not achieved, increase or decrease the INDUCTOR control and repeat Step 3. If arcing should occur between capacitor plates, increase or decrease the INDUCTOR control one position, then repeat Step 3. NOTE: If you can't achieve a SWR of 1:1, repeat Step 3 for each INDUCTOR control position.

5. After minimum SWR is achieved, transmitter power may be increased to 300 watts. Your VERSA TUNER II will reduce the SWR of most feed systems to 1:1. In some cases, a 1:1 SWR is not achievable. Increase or decrease the length of your antenna to improve SWR.

6. A SWR of 1:1 may occur at more than one set of control settings on your MFJ-948. When an SWR of 1:1 is obtained, check transmitter power. Ensure that transmitter power is relatively high. If transmitter power has decreased substantially, try another INDUCTOR control setting and repeat Step 3.

7. When using the MFJ-948 for receiving only, tune the MFJ-948 as described in Step 1 and Step 2.



MFJ-948 SCHEMATIC DIAGRAM